(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 3 April 2003 (03.04.2003)

PCT

(10) International Publication Number WO 03/027431 A3

(51) International Patent Classification⁷: C09K 3/00

E21B 43/26,

(21) International Application Number: PCT/US02/30202

(22) International Filing Date:

24 September 2002 (24.09.2002)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/325,071 60/340,224 26 September 2001 (26.09.2001) US 7 December 2001 (07.12.2001) US

(71) Applicant and

(72) Inventor: COOKE, Claude, E., Jr. [US/US]; 197 Lake View Circle, Montgomery, TX 77356 (US).

(74) Agent: COOKE, Claude, E., Jr.; Baker Botts L.L.P., 910 Louisiana Street, One Shell Plaza, Houston, TX 77002 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR).

Declaration under Rule 4.17:

as to the identity of the inventor (Rule 4.17(i)) for all designations

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 19 June 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

27431 A3

(54) Title: METHOD AND MATERIALS FOR HYDRAULIC FRACTURING OF WELLS

(57) Abstract: Hydraulic fracturing of wells by injecting a degradable polymer phase as a fracturing fluid is provided. Composition and degree of polymerization of the degradable polymer and the selection of additives may be varied to adjust the viscosity, degradation time and other properties of the fracturing fluid. Viscous degradable fluid or pellets of degradable polymer may be placed in a wellbore as an internal phase in a low viscosity carrier fluid. A polymer-continuous liquid phase may be formed at a selected location in the wellbore, usually near perforations, before the polymer phase is pressured into a formation to form a hydraulic fracture.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/30202

A. CLASSIFICATION OF SUBJECT MATTER			
IPC(7) : E21B 43/26; C09K 3/00			
US CL : 166/308; 507/209, 219, 221, 922, 924			
According to International Patent Classification (IPC) or to both national classification and IPC			
B. FIELDS SEARCHED			
Minimum documentation searched (classification system followed by classification symbols)			
U.S. : 166/308; 507/209, 219, 221, 922, 924			
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched			
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)			
EAST			
O DOCUMENTS CONSTRUED TO BE DELEVANT			
	UMENTS CONSIDERED TO BE RELEVANT		r <u></u>
Category *	Citation of document, with indication, where a	·	Relevant to claim No.
X	US 5,699,860 A (GRUNDMANN) 23 December 19	997 (23.12.1997), Example 1 and	24, 25, 30-32
	column 4, lines 22-27.		
X	US 5,439,059 A (HARRIS et al) 08 August 1995 (08.08.1995), column 6, lines 39-45.		
	17, 21-23		
X	US 4, 417, 989 A (HUNTER) 29 November 1983 (29.11.1983), column 6, lines 36-47. 24, 25, 30		
A	US 4,715,967 A (BELLIS et al) 29 December 1987 (29.12.1987) see claims.		
			•
		i	1
			i
			1
			ì
		ı	1
Further documents are listed in the continuation of Box C. See patent family annex.			
Special categories of cited documents: "T" later document published after the international filing date or priority			
date and not in conflict with the application but cited to understand the			
"A" document defining the general state of the art which is not considered to be principle or theory underlying the invention			
or particu	lar relevance	"X" document o, particular relevance; the o	taimed invention cannot be
"E" earlier app	plication or patent published on or after the international filing date	considered novel or cannot be consider	
when the document is taken alone			
	which may throw doubts on priority claim(s) or which is cited to he publication date of another citation or other special reason (as	"Y" document of particular relevance; the o	laimed invention cannot be
	specified) considered to involve an inventive step when the document is		
combined with one or more other such documents, such combination			
"O" document referring to an oral disclosure, use, exhibition or other means being obvious to a person skilled in the art			
"P" document published prior to the international filing date but later than the "&" document member of the same patent family			
priority date claimed			
Date of the actual completion of the international search Date of mailing of the international search report			
07 ADD 2003			
Name and mailing address of the ISA/US Authorized officer			
Commissioner of Patents and Trademarks Box PCT Philip C Tucker			~4 1
Washington, D.C. 20231			
Facsimile No. (703)305-3230		Telephone No. 703-308-0651	4

Form PCT/ISA/210 (second sheet) (July 1998)